

# M.A.P.S. *Digest*

Official Publication of  
Mid-America Paleontology Society

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May – June, 2007



**DIGEST CONTRIBUTIONS WANTED**

Articles and other materials of paleontological interest are needed for future issues of the Digest. Soft copy in Microsoft Word is preferred. Please email materials if possible to either:

[fossilnautiloid@aol.com](mailto:fossilnautiloid@aol.com)  
[cdcozart@aol.com](mailto:cdcozart@aol.com)

Hard copy may be mailed to:  
John Catalani  
3405 High Trail  
Woodridge, IL 60517

**ABOUT THE COVER**

Image by Charles Newsome

This month's cover photo is EXPO Keynote speaker Peter Larson presenting his Talk, "The Night of the Living Dead: Reconstructing T. Rex Behavior".

Pete discussed his role as a Dinosaur "CSI" and the evidence of dinosaur behavior, diseases, and causes of death that may be inferred from study of fossil bones.

**EXPO AUCTION RAISES OVER \$5,000**

**By Sharon Sonnleitner**

The 2007 Expo live and silent auctions raised over \$5,000, thanks to the generous donations of the dealers, including Michael and Barbara Sincak from Treasures of the Earth, who donated many items, and Steve Nicklas, Mike Manning, Rob Sula, and Mr. Coleman from Paleo Prospectors, who donated a dinosaur dig trip that brought \$1,450. Silent auctions on Friday and Saturday brought in \$1,205.60. Saturday night's live auction of 67 items raised \$3,868 and cash donations added another \$125 to bring the total to \$5198.60, which far surpasses any previous auction. Top-selling items from the live auction were: dinosaur dig trip (\$1450), Hadrosaur egg (\$195), tool from Paleotools (\$180), dinosaur egg (\$130), and a *Keyseioops free* trilobite (\$95). Auction money is donated to the Paleontology Society for graduate scholarships and the Strimple Fund; the Paleontological Research Institution (PRI); and the Richard S. Rhodes II Memorial Fund for the Paleontology Repository at the University of Iowa, where regular MAPS meetings are held.



**Photo by Jim Preslicka**



## SCENES FROM EXPO 2007



Many thanks to Michael & Barbara Sincak and their staff from Treasures of the Earth for bringing to Expo this cast of *Tsintaosaurus* (sin-tau-SAWR-us), a Late Cretaceous Hadrosaur from Shandong Province, China. It is the only giant Hadrosaur with a vertical bony projection or spike on the top of its head. This spike is particularly odd because, unlike other crested Hadrosaurs, the spike projects forward and up, just like the legendary unicorn. The diet of Tsintaosaurus was probably grass, fruit, twigs, pine needles and seeds. This replica was made from the one and only original specimen on display at the Beijing Natural History Museum. This specimen is approximately 27 feet long, from head to tail and stands just over 10 feet high at the hips. It made a very impressive centerpiece exhibit at Expo.



Pete Larson (center), from the Black Hills Institute of Geological Research in Hill City, South Dakota, was Friday's keynote speaker. One thought-provoking point from his presentation on *The Night of the Living Dead: Reconstructing T. Rex Behavior Using Taphonomy and Pathologies* was the presence of *T. rex* bite marks on all the *T. rex* jaws. Since evidence suggests the bites were inflicted on adults, the bites suggest *T. rex*es were very aggressive with each other.



A portion of the dealers on the gym floor.



A large crinoid plate

**MAPS General Meeting Minutes  
Western Hall, Western Illinois University  
Macomb, Illinois  
March 31, 2007**

The meeting was called to order by President Marv Houg. Marv introduced the MAPS officers to the happy throng. The minutes of the February meeting were read and approved. Sharon Sonnleitner presented the treasurer's report. This summation showed \$12,372.72 in savings and \$1171.04 in checking for a total balance of \$13,543.76. A motion was made and seconded to approve the transactions of the Treasurer's office. Motion carried.

Sharon Sonnleitner recognized the many individuals that helped at the front desk. Randy Faeber acknowledged the people that assisted at both the silent and live auctions. John Catalani and Chris Cozart were recognized as co-editors of the MAPS Digest. Mark Shurilla was thanked for his work as MAPS Digest EXPO Edition Editor.

The MAPS Board has decided to open up the EXPO Digest for limited advertising to help defray the cost of publishing. A lively discussion about advertising followed this announcement and some wondered if there would be a change in the mailing rate if the EXPO Digest contained advertising.

Mark Shurilla was advised that some members would like the EXPO Digest to be more "homespun" and catering to amateurs. Other members would like the articles to be more professional in nature. It is impossible for the EXPO Digest to be all things to all people. However, a copy of the EXPO digest would like to be reviewed by the Board prior to publication. Time constraints could become a major issue.

It was reiterated to the members that MAPS does not want to be in the business of selling the EXPO Digest to museums or other places of business. If some individual wishes to do this, MAPS will probably sell the Digest to the individual at cost.

A budget of \$5500 plus advertising revenue was set by the Board for the publication of the 2008 EXPO Digest.

A new Directory will be published every year instead of every two years.

Mark Shurilla made a suggestion that the MAPS Digest should be online. This topic was tabled for further discussion. The members were adamant that no membership lists should ever be on the MAPS website.

The Board proposed that "Cenozoic Vertebrates" be the theme for the 2008 EXPO. John Catalani made a motion to accept this proposal. Tom Williams seconded the motion. Motion carried.

Sharon Sonnleitner wondered if it would be possible to have MAPS field trips in other parts of the country hosted by local paleontological societies or other rock clubs with a strong fossil interest. Would it be possible to open up their field trips to include MAPS members?

Randy Faeber made a motion for adjournment. Karl Stuekerjuergen seconded the motion. Motion carried.

An enthusiastic crowd supported the live auction following the meeting.

**MAPS Board Meeting Minutes**  
**Western Hall, Western Illinois University**  
**Macomb, Illinois**  
**March 31, 2007**

The meeting was called to order by President Marv Houg. The format of the EXPO Digest was discussed. Several Board members thought the EXPO edition was improved from the previous year. Gil Norris made a motion that the articles in the next EXPO Digest should be targeted toward our membership – a mix of amateurs and professionals. The Board would like to review the articles prior to publication. Charles Newsom seconded the motion. Motion carried.

The topic of advertising in the EXPO Digest was examined by the Board. It was decided to allow limited advertising in the EXPO Digest with the rate set by the Board with input from Mark Shurilla – EXPO Digest Editor.

A motion was made by Karl Stuekerjuergen and seconded by Gil Norris to set the budget for the 2008 EXPO Digest at \$5500 plus the advertising revenue. Motion carried.

Sharon Sonleitner made a motion that MAPS not be in the business of selling the EXPO Digest to museums or other businesses. However, if some individual wishes to do this, MAPS will sell the Digests at cost. Gil Norris seconded the motion. Motion carried.

Gil Norris made a motion that the Board presents “Cenozoic Vertebrates” as the 2008 EXPO theme. Karl Stuekerjuergen seconded the motion. Motion carried.

The next meeting was set for May 13, 2007, possibly in conjunction with a field trip to the Iowa City area. *(That meeting date has since been dropped because it is Mothers Day.)*

Charles Newsom made a motion to adjourn. Karl Stuekerjuergen seconded the motion. Motion carried.

11<sup>th</sup> February, 2007

Dear Sharon,

Thank you very much for your letter of January 20 and the attached check for \$2500, payable to the Paleontological Society.

We are very grateful to the Mid America Paleontology Society for your continued support of our program of grants to students, in support of their research. Our members have told us, in a survey conducted a couple of years ago, that support of research by graduate students and occasional undergraduates is their highest priority among our activities, apart from publication of results of new paleontological research in our two journals and occasional memoirs.

Last year, we received about 60 applications from students for support for their work. Two MAPS awards of \$1000 each went to the top applicants and a MAPS award of \$700 went to a third person. We were able to do this because we had a little money carried over from the previous year. We also distributed grants of \$500 to each of 26 additional applicants using income from our endowment and general funds. The recipients of the 2006 MAPS Awards and their research topics were:

\$1000    Marcela Martinez-Millan (Cornell University) Earliest representative of the Asteridae (Magnoliophyta): a taxonomic revision

**\$1000 Matt Freidman (University of Chicago) Morphology and relationships of early osteichthyans from the Devonian of East Greenland**

\$700 Kirk Lewis Domke (University of California)  
Paleoecology of the earliest Cambrian biomineralizing  
organisms in western North America

Support of work by young scholars, at the beginning of their careers is critical to the future of research in paleontology. Please tell the members of MAPS how much we appreciate their support of this important endeavor. Thanks!

Yours sincerely, Roger Thomas  
Secretary, The Paleontological Society  
John Williamson Nevins Professor of Geosciences  
Franklin and Marshall College

26 January 2007

Dear Sharon,

It is a pleasure to acknowledge the Mid America Paleontology Society's recent unrestricted gift of \$700 to the Paleontological Research Institution. This gift will make a meaningful difference in advancing and disseminating knowledge of the history of life on Earth and is greatly appreciated.

As a donor, you are part of a dedicated group of friends who realize the value of unrestricted support. Funds contributed to PRI without restriction afford us the greatest flexibility in meeting our financial obligations. The support received this past year alone has resulted in a stronger organization, better equipped to actively focus on and execute our fourfold mission: education, collections, research and publications.

...Thank you for your support.

Sincerely, Warren D. Allman, Director

[illegible]February 8<sup>th</sup> 2007

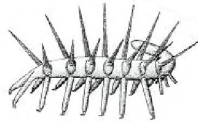
Dear Sharon,

Thank you so much for the donation of \$500 you sent to the Richard S. Rhodes II Memorial Fund on behalf of the Mid America Paleontology Society. As always the support we receive from MAPS is very much appreciated. The Richard S. Rhodes II Memorial Fund is a new fund set up in 2006, thanks to a bequest to the Paleontology Repository by our friend Richard "Sandy" Rhodes. The Memorial Fund (interest from the endowed capital) will be used to support the running of the Repository, for example, purchase of curatorial supplies, travel costs for invited visitors and students, and stipends for otherwise unpaid student assistants. Following your donation we were able to purchase additional shelving for the Crossman Collection of Midwest crinoids. This will help us organize the collection more efficiently and prepare it for scientific study.

Thank you again for your generous support. We look forward to working with you in 2007.

Yours sincerely, Tiffany Adrain, Collections Manager,  
Paleontology Repository





## Paleo News Items



Karen Nordquist, ESCONI

### Fossilized Rain Forest Found in Illinois Coal Mine



Just south of Danville Illinois in Vermillion County a 300 MY old rainforest has been found along the ceiling of two adjacent coal mines, the Riola mine and the Vermillion Grove mine. The forest is about 40 square miles in size and is believed to be one of the first rainforests on Earth at some time about 310 to 290 MYA. It had a layered structure like today's rainforests with a mix of plants that are now extinct. There were many club mosses that stood more than 130 feet high that stood high over the tree ferns and other shrubs and horsetails. It may have all been buried in mud after a major earthquake 300 MYA which caused it all to drop below sea level. Studying it are Scott Elrick of the Illinois State Geological Survey,

paleobotanist Howard Falcon-Land of the University of Bristol and William DiMichele a curator of fossil plants from the Smithsonian. The photo shows a pteridosperm a fern-like plant from the site. (**Geology**, May)

### T. rex Protein Discovered in 68 MY Old Bone



Mary Schweitzer and Jack Horner continue to delve into the bones of his *T. rex* and have now found within the soft tissues 68 MY old protein. This is in the form of collagen from the thigh bone from *B. rex* which was found 1,000 feet below the surface (Jack and bone pictured at left). It is believed that the fact that it was buried so deep may have protected the tissues within the bone from contamination by bacteria and water over the millions of years. It was discovered by Bob Harmon in 2000 in Eastern Montana and part of the femur then was studied by Schweitzer. She found soft tissue including blood vessels in the bone. This is also the specimen where they found medullary bone which shows that this is a female *T. rex*. Now comes the discovery of collagen which is the main organic compound found in bone. They have found seven protein sequences from the collagen which previously was thought to be impossible. Keep in mind this is not DNA! Three of these sequences are more like those found in a chicken than any other organism, reinforcing the connection between dinosaurs and birds. One matched that of a

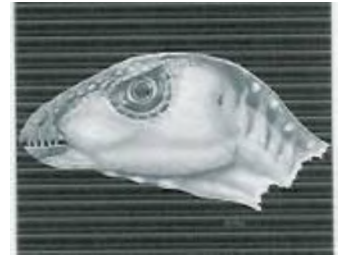
newt and one matched that of a frog. There are those who are not fond of Mary's techniques because it requires breaking bones and destructive analytical techniques. But the results are truly fascinating and groundbreaking. Horner is sending over 100 people out to the field this summer to dig deep for bones that may have little contamination and may hold more information for Mary to discover. (Schweitzer, Horner et al in **Science**)

### Digging Dinosaur Found in Burrow – *Oryctodromeus*

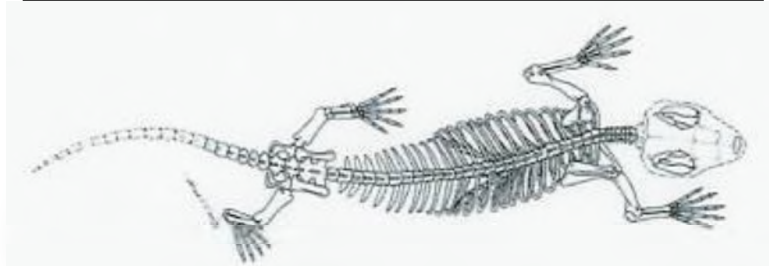


These dinosaurs were found in Montana is believed to have been found within their burrow that has been dated to the Mid Cretaceous at 135-115 MYA. It has been named *Oryctodromeus cubicularis* a mix of Greek and Latin meaning “digging runner of the lair”. An adult and two juveniles were found in a chamber at the end of the sinuous 2 meter (6.5 ft) long

burrow that was 70 cm wide (2.3 ft). The adult would have been about 2.1 meters long (6.9 ft) and would have weighed about 48 to 70 pounds. It was about the size of a coyote. It has strong forearms and shoulders for digging and could probably push dirt with its snout. At first the burrow seemed too small for the dino, but animals can squeeze into small places and it would keep out larger predators. The juveniles were about half the size of the adult and the fact that they were found together does indicate parental care. (Varricchio et al in **Proc. Roy Soc B**)



### New Mesozoic Mammal from China – *Yanoconodon*



Yet another almost complete mammal fossil from China dated to 125 MYA provides more evidence of mammal evolution – this time involving the ear. This fossil is from the Yixian Formation from Hebei about 300 km from Beijing. The mammal ear consists of three bones the hammer or malleus, the anvil or incus, and the stirrup or stapes, plus a bony ring for the eardrum called the tympanic membrane. These bones evolved from the bones of the jaw hinge in their reptilian relatives. *Yanoconodon* clearly shows the intermediate condition of how mammals acquired this middle ear structure. This small animal was only about 5 inches long and would weigh only about 30 grams. It is a triconodont because it had three cusps in a straight line on its molars and it fed on insects and worms. It had a long body with short sprawling limbs with claws for digging or living on the ground. It had a large number of chest and lumbar vertebrae at 26 with most mammals having 19 or 20. It is unusual to have lumbar ribs when none of its relatives do. It is more closely related to placentals and marsupials than to monotremes as seen in the tree to the left. This separation of the delicate ear bones for better hearing and to have a more robust lower jaw for better feeding is an important evolutionary innovation for mammals. The ear bones are more separate in *Yanoconodon* than they are in *Morganucodon* and are more similar to those in modern mammals. Its name, *Yanoconodon allini*, comes from its location and tooth structure – ‘Yan’ for the Yan mountains, ‘con’ for cusps, and ‘don’ for tooth. (Luo et al in **Nature** Vol. 446 3/15/07)

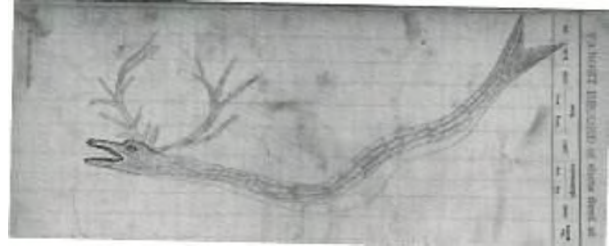


### Jurassic Croc with Fish Tail



This discovery comes from Oregon where researchers were digging for Jurassic ammonites. What they found was about 50% of a 6 to 8 foot long reptile with long needle like teeth in the Snowshoe Formation. Although it looked like a crocodile it had the tail of a fish and lived between 150 and 180 MYA somewhere in the middle Pacific. It is believed to be of the species *Thalattosuchia* and will be displayed on loan to the Rice Northwest Museum of Rocks and Minerals in Hillsboro

Oregon after two years of prep work at the University of Iowa. Its short stubby legs would have allowed it to move on land and may have been webbed to allow it to swim well along with the fish tail. An interesting similarity between this fossil and Native American traditions is brought to mind by Adrienne Mayor, author of the recent book "Fossil Legends of the First Americans". She illustrates it in her book as seen to the left (p. 193). The needle teeth, scales and fish teeth are similar. She speculates that perhaps a fossil was found weathering out by some Indian observers back in the 1890's when this was drawn by a Kiowa artist Silverhorn. This is a fascinating development. (ScienceDaily)



### Many Dinosaurs Had Tiny Genomes

A surprising Harvard report says that many dinosaurs in fact had relatively small genomes, genomes as small as those of their relatives – birds. They have determined this by linking bone cell size and genome size among living and fossil species of 31 species whose bone cells were measured. Their findings show that *T. rex* and *Velociraptor* had very small genomes like birds while Ornithischians like *Triceratops* and *Stegosaurus* had more moderately sized genomes like crocodiles and lizards. They are unsure about those of sauropods yet. They think that the difference in size may be due to different amounts of repetitive and non-coding DNA in the two groups of species which is the usual factor responsible for variation in genome size. They estimate 12% active repetitive DNA in the ornithischian genome and only 8.4% in the theropod genome. This indicates that the small genome evolved in dinosaurs some 230 to 250 MYA rather than with the emergence of birds just 110 MYA. It had been thought that the small genome evolved with flight as a means of conserving energy for flight, but should now be added to the list of dinosaur traits. During this study the researchers found that the bone cells or osteocytes tend to reflect the size of the organism's genome. They could then use this information to predict the size of the fossil genome. The cells reside in individual lacunae or small pockets inside bone tissue that is very durable, making measurements possible. (Organ and Edwards in *Nature*)

## FOSSILS OF IOWA REPRINTED

Fellow long time MAPS member Robert Charles Wolf has had his book Fossils reprinted. Originally published in 1983 by Iowa State University Press, Fossils of Iowa lists more than 150 collecting sites in Iowa and adjacent parts of Minnesota and Nebraska ranging from the PreCambrian to the Permian inclusive. There are thirty plates of fossil illustrations. It is a field guide primarily for the amateur collector and is based on first hand knowledge.

Unfortunately for many years the book has been out of print. Most original copies are now well worn, with loose pages. The book is again available through Backinprint.com for collectors who would like a new copy, or perhaps never had the original. For further information or to purchase any Backinprint.com title, please visit [www.backinprint.com](http://www.backinprint.com)."

Except for a new cover the book is an exact copy of the original. Of course some of the original information is dated but to solve this Robert has self produced a CD to bring the book up to date. Anyone may obtain the e-mail file from him that can be copied on CD or self printed. People who order a copy of the book from the author automatically receive the CD. Even better, anyone with an old copy of the book can also ask for the file, free of charge. Simply send an e-mail request. If you don't have e-mail contact him by regular mail and he will send you a CD or printed update for a small shipping charge.

The book may be ordered from various places at prices around \$16.95. Autographed copies can be ordered direct from the author for \$16.95 plus \$4 shipping. Iowa residents add \$1.02 for tax.

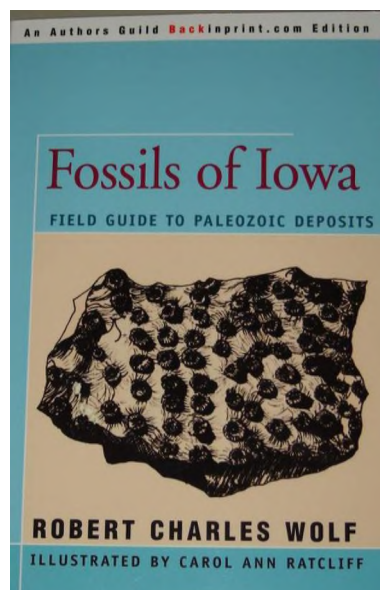
Contact:

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The Mid-America Paleontology Society (MAPS) was formed to promote popular interest in the subject of paleontology; to encourage the proper collecting, study, preparation, and display of fossil material; and to assist other individuals, groups, and institutions interested in the various aspects of paleontology. It is a non-profit society incorporated under the laws of the State of Iowa.

Membership in MAPS is open to anyone, anywhere who is sincerely interested in fossils and the aims of the Society.

Membership fee: \$20.00 per household covers one year's issues of DIGESTS. All Canadian and Overseas members receive the DIGEST by air letter post. For new members and those who renew more than 3 issues past their due date, the year begins with the first available issue. Institution or Library fee is \$25.00. (Payments other than those stated will be pro-rated over the 6 yearly issues.)

MAPS meetings are held on the 2nd Saturday of October, November, January, and February and at EXPO in March or April. A picnic is held during the summer. October through February meetings are scheduled for 1 p.m. in Trowbridge Hall, University of Iowa, Iowa City, Iowa. One annual International Fossil Exposition is held in April or late March.

The MAPS official publication, MAPS DIGEST, is published 6 times per year – January, Feb/March, April, May/June/July, August/Sept, Oct/Nov/Dec.



**CYATHOCHRINITES**